III.5 FLOOD HAZARD, HYDROLOGY, AND DRAINAGE

This chapter describes the affected environment for Bureau of Land Management (BLM)-managed lands in the Land Use Plan Amendment (LUPA) Decision Area for concerns and resources regarding flood hazards, water quality, beneficial uses of water, and compliance with federal protections for designated National Wild and Scenic Rivers. The BLM lands in the desert, also known as the LUPA Decision Area, consist of the Desert Renewable Energy Conservation Plan (DRECP) area and California Desert Conservation Area (CDCA) lands outside the DRECP but managed by BLM. This section describes and explains the regulations that determine the use and management of water resources in the LUPA Decision Area.

This chapter also describes the affected environment outside the LUPA Decision Area since, in some areas, the construction and operation of transmission lines outside the LUPA Decision Area could be affected following implementation of the Proposed LUPA. In addition to the maps and figures in this chapter, Appendix R1.5 includes an additional table that identifies the range of stream flows within the LUPA Decision Area as ephemeral, intermittent, or perennial.

III.5.1 Regulatory Setting

The following summary of federal, state, and local laws and regulations that protect surface water in the LUPA Decision Area is followed by descriptions of flooding, drainage, and other hydrologic conditions and processes.

III.5.1.1 Federal

III.5.1.1.1 Clean Water Act

The Federal Water Pollution Control Act (Clean Water Act [CWA]) created a broad national program to protect water quality and regulate waste and pollutant discharges in United States waters (Title 33 United States Code [U.S.C.] Section 1251 et seq.). It grants the authority to establish water quality standards and waste discharge limits for point-source discharges (e.g., from industrial facilities, sewage treatment plants, and stormwater). The CWA also prohibits discharges of pollutants without a permit or other authorization and allows authorized states to implement provisions of the CWA in place of the federal Environmental Protection Agency (EPA).

Key CWA provisions include:

- Section 401 – Water Quality Certification requirements for federally permitted activities like construction that may result in discharges to surface waters and wetlands.

- Section 402 – National Pollutant Discharge Elimination System permit program for point source discharges, including stormwater.
- Section 404 – Permit program for controlling discharges of dredge or fill materials into surface waters and wetlands; the U.S. Army Corps of Engineers implements its provisions. Activities in waters of the United States regulated under this program include fill for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways, power plants, and renewable energy projects), and mining projects. Section 404 also requires a permit before dredged or fill material may be discharged into waters of the United States unless the activity is exempt (e.g., certain farming and forestry activities). The basic premise of the program is that no discharge of dredged or fill material may be permitted if a practical, less damaging alternative exists, or if U.S. waters would be significantly degraded. In other words, when applying for a permit, an applicant must demonstrate that steps have been taken to avoid adverse impacts to wetlands, streams, and other aquatic resources; that potential impacts have been minimized; and that compensation will be provided for any remaining unavoidable impacts. For most discharges with only minimal adverse impacts, a general permit may suffice. General permits are issued on a national, regional, or state basis for specific categories of activities. The general permitting process eliminates individual review and allows some activities to proceed with little or no delay (provided that the general or specific conditions for the general permit are met). For example, minor road activities, utility line backfill, and bedding are routinely granted general permits. Section 404 permits are also subject to CWA Section 401 water quality certification through a Regional Water Quality Control Board (RWQCB). Renewable energy development (including that proposed by LUPA) would be subject to Section 404 permitting if the project scope includes discharge of dredged or fill material into waters of the United States.

The EPA defines the waters of the United States as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
2. All interstate waters including interstate wetlands.
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
   (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes.

(ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

(iii) Which are used or could be used for industrial purposes by industries in interstate commerce.

4. All impoundments of waters otherwise defined as waters of the United States under this definition include:
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section.
6. The territorial sea

Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section that are not waters of the United States include waste treatment systems and treatment ponds and lagoons that meet CWA requirements (other than cooling ponds as defined in 40 Code of Federal Regulations (CFR) 423.11[m] that also meet the criteria of this definition).

Waters of the United States do not include converted cropland. Despite an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act the final authority on CWA jurisdiction resides with EPA (40 CFR 230.3[s]).

III.5.1.1.2 Resource Conservation Recovery Act (RCRA)

The Resource Conservation and Recovery Act (RCRA) (42 United States Code [U.S.C.] 6901 et seq.) (40 CFR Part 260 et seq.) is a comprehensive body of regulations that empower EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. The RCRA also provides the framework for managing nonhazardous solid wastes. The RCRA is jointly administered in California by the Department of Toxic Substances Control and California RWQCBs.

III.5.1.1.3 Reclamation Reform Act

The Reclamation Reform Act of 1982 mandates that the Bureau of Reclamation manage, develop, and protect water and water-related resources.

III.5.1.1.4 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of March 10, 1934, authorizes the secretaries of Agriculture and Commerce to assist and cooperate with federal and state agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, and to study the effects of domestic sewage, trade wastes, and other pollutants on wildlife. This act also directs the Bureau of Fisheries to use impounded waters for fish-culture stations and migratory-bird resting and nesting areas, and requires consultation with the Bureau of Fisheries before building new dams in order to protect fish migration. This law additionally requires plans and wildlife surveys that protect wildlife on public lands, and manages the donation of funds or lands to federal agencies.

Amendments to the act, enacted in 1946, require consultation with the U.S. Fish and Wildlife Service (USFWS) and the fish and wildlife agencies of states where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency under a federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources." The amendments authorize the transfer of funds to the U.S. Fish and Wildlife Service (USFWS) to conduct related investigations. Land donated or transferred by a developer as mitigation for wildlife protection is to be either managed directly by USFWS or by other agencies or conservation organizations under the umbrella of cooperative agreements with the Secretary of Department of Interior (DOI). General plans may also transfer project lands to a state for management.

A 1948 amendment authorized use of surplus federal property for wildlife conservation. 1958 amendments recognized the vital contribution of wildlife resources to the nation and required equal consideration and coordination of wildlife conservation with other water resource development programs. These amendments also authorized DOI to designate public fishing areas and accept donations of lands and funds. The amendments further expanded conditions where diversions or modifications to water bodies would require consultation with USFWS. They also required that permitted lands valuable to the Migratory Bird Management Program be made available to the state agency that controls wildlife resources for management.

III.5.1.1.5 Executive Order 11990 Protection of Wetlands

The basic requirement of Executive Order (EO) 11990 is that federal agencies prohibit construction or management practices that would adversely affect wetlands, unless an agency finds that there is either no practical alternative, or that a proposed action has considered all practical measures to minimize harm to the wetlands. EO 11990 directs all federal agencies to minimize the destruction, loss, or degradation of wetlands. The order also directs agencies to preserve and enhance the natural beneficial values of wetlands in the conduct of the agency's responsibilities for (1) acquiring, managing, and disposing of federal lands and facilities; (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting federal activities and programs affecting land use, including but not limited to water and related land resource planning, regulating, and licensing.

III.5.1.1.6 Executive Order 11988: Floodplain Management

EO 11988 requires federal agencies to avoid, to the extent possible, both long- and short-term adverse impacts from the occupancy and modification of floodplains, and to avoid both direct and indirect support of floodplain development wherever there is a practical alternative. This order states that "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities" for:

- Acquiring, managing, and disposing of federal lands and facilities.
- Providing federally undertaken, financed, or assisted construction and improvements.
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

The guidelines address an 8-step process that agencies should carry out as part of their decision-making on projects that could potentially impact a floodplain. The eight steps, summarized here, reflect the decision-making process required in Section 2(a) of EO 11988.

The guidelines' eight steps:

1. Determine if a proposed action is in the base floodplain (an area that has a 1% or greater chance of flooding in any given year).
2. Conduct early public review, including public notice.
3. Identify and evaluate practicable alternatives to locating in the base floodplain, including alternative sites outside the floodplain.
4. Identify impacts of the proposed action.
5. Develop measures to minimize impacts and restore and preserve the floodplain, as appropriate, if impacts cannot be avoided.
6. Re-evaluate alternatives.
7. Present the findings and a public explanation.
8. Implement necessary actions.

Among a number of other things, the Interagency Task Force on Floodplain Management clarified development in floodplains and emphasized that agencies should select alternative sites for projects outside floodplains and, where practical, develop measures to mitigate unavoidable impacts.

III.5.1.1.7 Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.)

The Wild and Scenic Rivers Act establishes that certain U.S. rivers and their immediate environments possess such remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other values that they shall be preserved in free-flowing condition and protected for the benefit and enjoyment of present and future generations (16 U.S.C. 1271). The act both identifies specific river reaches for designation as wild or scenic and provides criteria for classifying additional river reaches (16 U.S.C. 1272). "Wild river areas" are rivers or sections of rivers that are free from impoundments and generally inaccessible only by trail; their watersheds or shorelines are essentially primitive and their waters unpolluted. These environments represent the vestiges of primitive America. "Scenic river areas" are rivers or sections of rivers that are free from impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible by roads in some places. "Recreational river areas" are rivers or sections of rivers that are readily accessible by road or railroad, so may have some development along their shorelines, and may have undergone some impoundment or diversion in the past (16 U.S.C. 1273).

The National Wild and Scenic River System was established to protect the environmental values of free-flowing streams from degradation, including from water resources projects. The system is administered jointly by the U.S. Forest Service (USFS), U.S. Department of Agriculture (USDA), National Park Service (NPS), and DOI, which includes BLM. U.S. Army Corps of Engineers (USACE) activities on streams in the system are subject to review by whichever of these agencies is responsible for a specific stream. In all planning for the use and development of water and related land resources, all potential national wild, scenic, and recreational river areas shall receive consideration. All river basin and project plan reports submitted to the United States Congress shall also consider and discuss such areas (16 U.S.C. 1276[d]). See Chapter III.14, BLM Special Designations, Classifications, Allocations, and Lands with Wilderness Characteristics, for more information.

III.5.1.2 State

III.5.1.2.1 California Fish and Game Code, Sections 1600-1616, as Amended

The California Department of Fish and Wildlife (CDFW) regulates activities that would divert or obstruct the natural flow or otherwise substantially change the bed, channel, or bank of any river, stream, or lake, or that would deposit or dispose of debris, waste, or other material where it may pass into any river, stream, or lake that supports fish or wildlife (Fish and Game Code, Section 1602). Although there are several conditions that trigger its authority and how it is acted upon, the Fish and Game Code states that all streams and lakes are subject to this regulation (Section 1600 et seq.). CDFW also has jurisdiction over riparian habitats (e.g., southern willow scrub) associated with watercourses. Any person who proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake or use materials from a streambed must formally notify CDFW before beginning the project (Section 1602). If CDFW determines that the project may adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required.

III.5.1.2.2 California Fish and Game Code, Sections 5650-5656, as Amended

It is unlawful to deposit in, permit to pass into, or place where it can pass into waters of the state any substance that is deleterious to fish, plant life, mammals, or bird life (Section 5650). This section does not apply to a discharge or a release that is (1) expressly authorized and in compliance with the terms and conditions of waste discharge requirements pursuant to Section 13263 of the Water Code; (2) a waiver issued pursuant to subdivision (a) of Section 13269 of the Water Code issued by the State Water Resources Control Board (SWRCB) or a regional water quality control board after a public hearing; or (3) expressly authorized pursuant to, and in compliance with, the terms and conditions of a federal permit for which SWRCB or a regional water quality control board has, after a public hearing, issued a water quality certification pursuant to Section 13160 of the Water Code.

III.5.1.2.3 Porter–Cologne Water Quality Control Act, as Amended

The Porter–Cologne Water Quality Control Act was established to protect the water quality and beneficial uses of waters of the state (California Water Code, Division 7, Section 13000 et seq.). The law gives broad authority to SWRCB and the state's nine RWQCBs to establish water quality standards and discharge prohibitions, issue waste discharge requirements, and implement provisions of the federal CWA. Under the Porter–Cologne Act, "waters of the state" include "any surface or groundwater, including saline water, within boundaries of the state" (California Water Code, Division 7, Section 13050 [e]). The SWRCB's jurisdiction under Porter-Cologne recognizes that:

- All waters of the United States (federal waters) are also waters of the state.
- All nonfederal waters are also waters of the state.
- All waters of the state are protected and regulated under Porter-Cologne.

There are two regulatory permitting pathways for projects or activities that would cause a discharge of dredged or fill material to waters of the state (i.e., any activity that fills, excavates, alters or causes any potential impact to water quality):

1. For activities affecting waters of the United States subject to a federal permit or license (typically a CWA Section 404 permit from the U.S. Army Corps of Engineers),

a CWA Section 401 water quality certification is required from either the SWRCB or RWQCB as applicable.

2. For other point source discharges to federal waters that do not require the submission of an application for a federal permit or license, or discharges that affect nonfederal waters, a “report of waste discharge” is required, and waste discharge requirements (WDRs) must be obtained from either the SWRCB or RWQCB (as applicable) before starting the activities.

Projects not subject to a federal permit or license that may affect waters under the jurisdiction of more than one RWQCB would apply for water quality certification or WDRs from the SWRCB.

There are two RWQCB hydrologic regions within the LUPA Decision Area, including the Lahontan and Colorado River regions, having jurisdiction within the LUPA Decision Area. The Lahontan is further divided into north and south basins; the South Basin is within the LUPA Decision Area (RWQCB 2005).

The Lahontan and Colorado River RWQCBs each have a Regional Water Quality Control Plan, also commonly referred to as a Basin Plan. The Basin Plans establish water quality standards for both surface water and groundwater. These standards include designated beneficial uses as well as narrative and numerical objectives, which must be both attained and maintained. Under both state and federal law there are additional anti-degradation policies that protect high-quality waters and limit degradation even where water quality exceeds standards.

III.5.1.2.4 Executive Order W-59-93

Executive Order W-59-93, signed by Governor Wilson on August 23, 1993, established state policy guidelines, with two primary goals, for wetlands conservation: to ensure no overall net loss, and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage in the state. At this writing, the State Water Board and a technical advisory team are still developing the statewide Wetland and Riparian Protection Policy; it remains in draft form. However, the Lahontan Basin Plan has established a “no net loss” policy for its wetland acreage, function, and value, so the State Water Board is implementing it through its dredge/fill program. The board’s discretionary actions and project approvals involving wetland impacts must still adhere to the standard of “no net loss” during this interim period, ahead of final approval of the policy.

III.5.1.3 Local

III.5.1.3.1 County General Plans and Development Codes

Grading on private land is subject to the terms and conditions of both a county's General Plan and its Development Code. If a proposed site is on federal land, county regulations do not directly apply to the project. However, the federal land manager has the authority to jointly determine, with counties, specific grading and soil erosion standards. If a county grading permit is required by the federal land manager, the grading plan must be completed in compliance with that county's General Plan and Development Code. County development codes may also include provisions for managing stormwater, disposing liquid waste, and extracting groundwater.

III.5.2 Flood Hazard, Hydrology, and Drainage Within the LUPA Decision Area

The LUPA Decision Area is primarily desert landscape with extremely scarce surface waters and flows. Annual precipitation ranges from approximately 3 inches in the low deserts to approximately 8 inches in the high deserts and desert ranges (United States Department of Agriculture 1997). Stream channels are typically ephemeral and formed by flash runoff events; these conditions have created various channel forms including alluvial fans, compound (braided) channels, discontinuous ephemeral (transient or short-lived) channels, and single-thread channels with floodplains (Lichvar and McColley 2008, CDFG 2010). Figure III.5-1 shows all the documented named and unnamed linear and areal surface water resources in the LUPA Decision Area. Figure III.5-2 displays only the documented named water bodies (both linear and areal surface water resources) in the LUPA Decision Area, including the Salton Sea, Owens Lake, and the Owens, Colorado, Mojave, Alamo, and Amargosa rivers. In the Imperial Valley, surface water is diverted from the Colorado and New Rivers, primarily for agricultural use, before draining via canals into the Salton Sea.

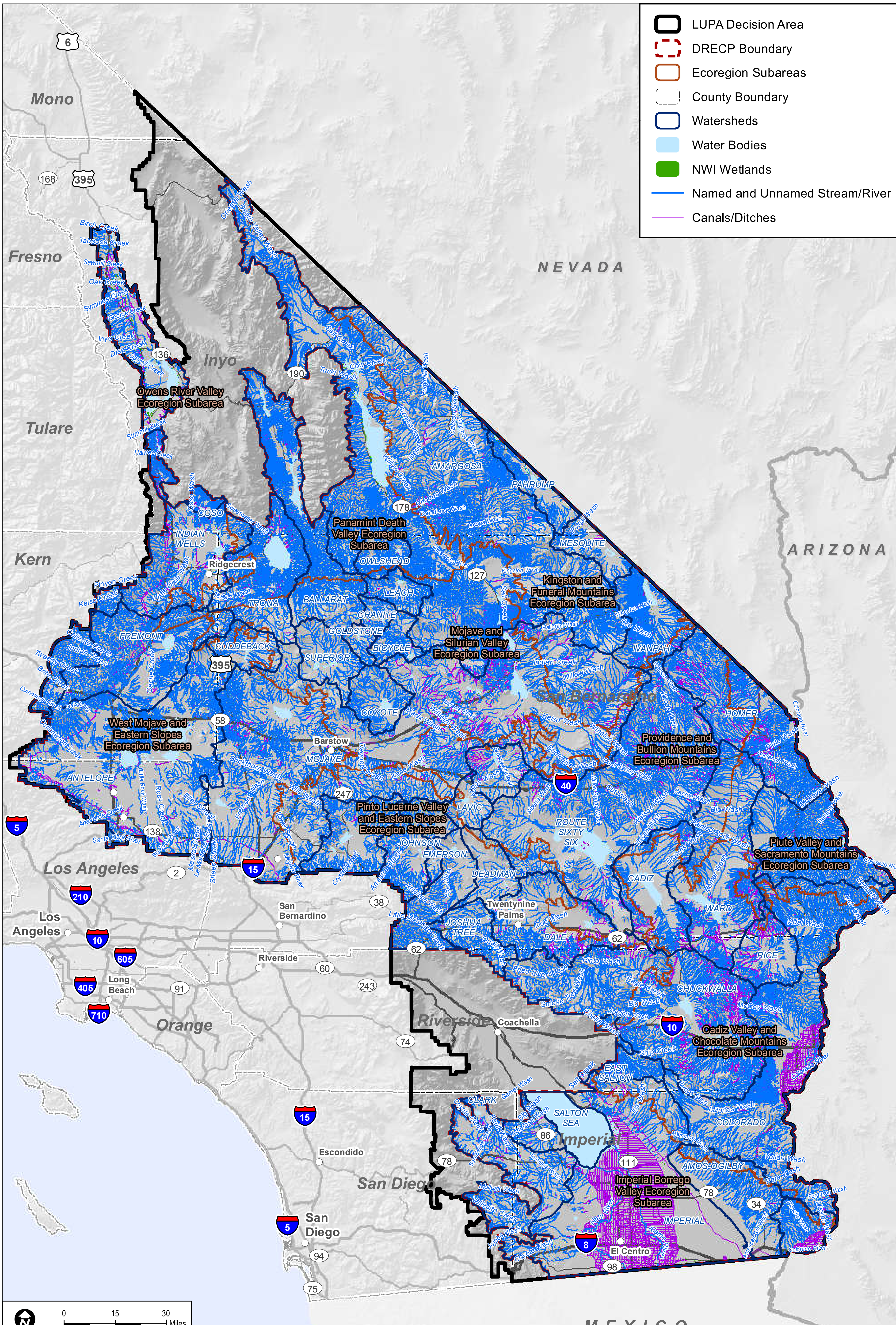
Linear water resources data evaluated in this environmental impact statement (EIS) comes from the National Hydrography Dataset (NHD) developed by the United States Geological Survey (USGS). The NHD is a feature-based, interconnecting database that uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system. NHD linear water resources data include ephemeral streams and rivers, perennial and intermittent streams and rivers, and canals and ditches within the LUPA Decision Area (USGS 2010). There may be additional linear water resources on individual project sites. While imperfect, this method does provide relative measures to identify and assess linear surface water features in ecological subareas.

Areal water resources data evaluated in this EIS comes from National Wetland Inventory (NWI) data developed by USFWS (USFWS 2014). This data set shows the extent, approximate location, and type of wetlands and deepwater habitats in the conterminous United States. This data delineates the areal extent of wetlands and surface waters (Cowardin et al. 1979). Certain wetland habitats are excluded from the NWI mapping program because of limitations of the aerial imagery used primarily to detect them. The USFWS also excludes certain types of "farmed wetlands," as defined by the Food Security Act, or lands that do not fit the NWI definition (Cowardin et al. 1979). The areal water resources data, also referred to as areal surface water bodies, includes ephemeral lakes and playas, perennial lakes and reservoirs, NWI wetlands (as compiled by USFWS), and swamps and marshes.

Spring data from NHD evaluated in this EIS was developed by USGS (USGS 2010). The locations of springs that are currently identified within the ecoregion subareas are shown in Figure III.5-3. There are numerous springs and seeps that support wetland habitats; they are generally found along mountain fronts, in canyons, and in areas of shallow bedrock. These springs and seeps are also associated with faulting and shallow groundwater. Wetland and marsh habitats are additionally found around the margins and fringes of playa lakes.

Sparse vegetation, lack of soil, high erosion rates, localized runoff, and reduced stream flow from evaporation and seepage create networks of closely spaced channels and high drainage densities in the LUPA Decision Area. Tributaries to larger washes and waterways tend to be smaller and more numerous than in more temperate regions (Bull and Kirkby 2002). In their lower reaches, streams drain into lowland valleys that contain numerous dry lakes and terminal basins (playas). In the Lahontan region, all surface waters drain internally. The terminal basins in the region are therefore alkaline or saline, and many are important migratory bird areas (e.g., recently re-watered portions of the Owens Dry Lakebed, and the Piute Springs north of Lancaster). Shallow overland, or sheet flow, characterizes drainage patterns in these areas of flat topography.

Highly variable, sudden, and unpredictable flooding is common in the LUPA Decision Area. This flooding is generally from winter storms (both rainfall and rapid mountain snowpack melt), tropical storms out of the southern Pacific Ocean, and summer thunderstorms. Summer storms pose a greater threat of flooding than winter storms due to their higher rainfall intensity, which can create a saturated surface that substantially reduces seepage and increases runoff and its associated sediment transport.



Sources: ESRI (2014); BLM (2015); USFWS (2013); USGS (2011); RECON (2015)

FIGURE III.5-1

Linear and Areal Surface Water Resources and Watersheds in the DRECP Plan Area

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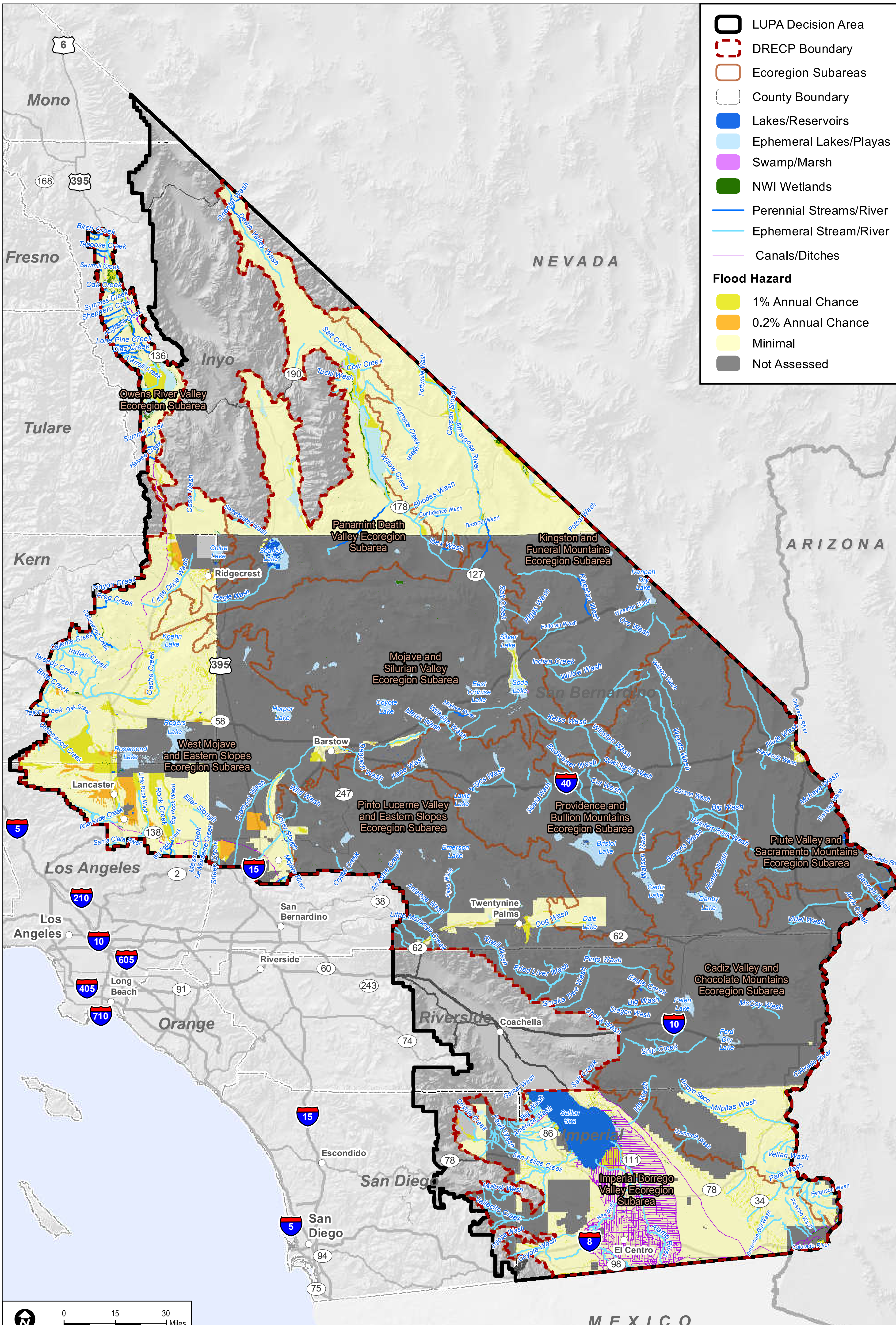

Sources: ESRI (2014); CEC (2013); BLM (2015); USFWS (2013); USGS (2011); FEMA (2012); RECON (2015)

FIGURE III.5-2

Named Water Bodies, Wetlands, and Flood Hazard Areas in the DRECP Plan Area

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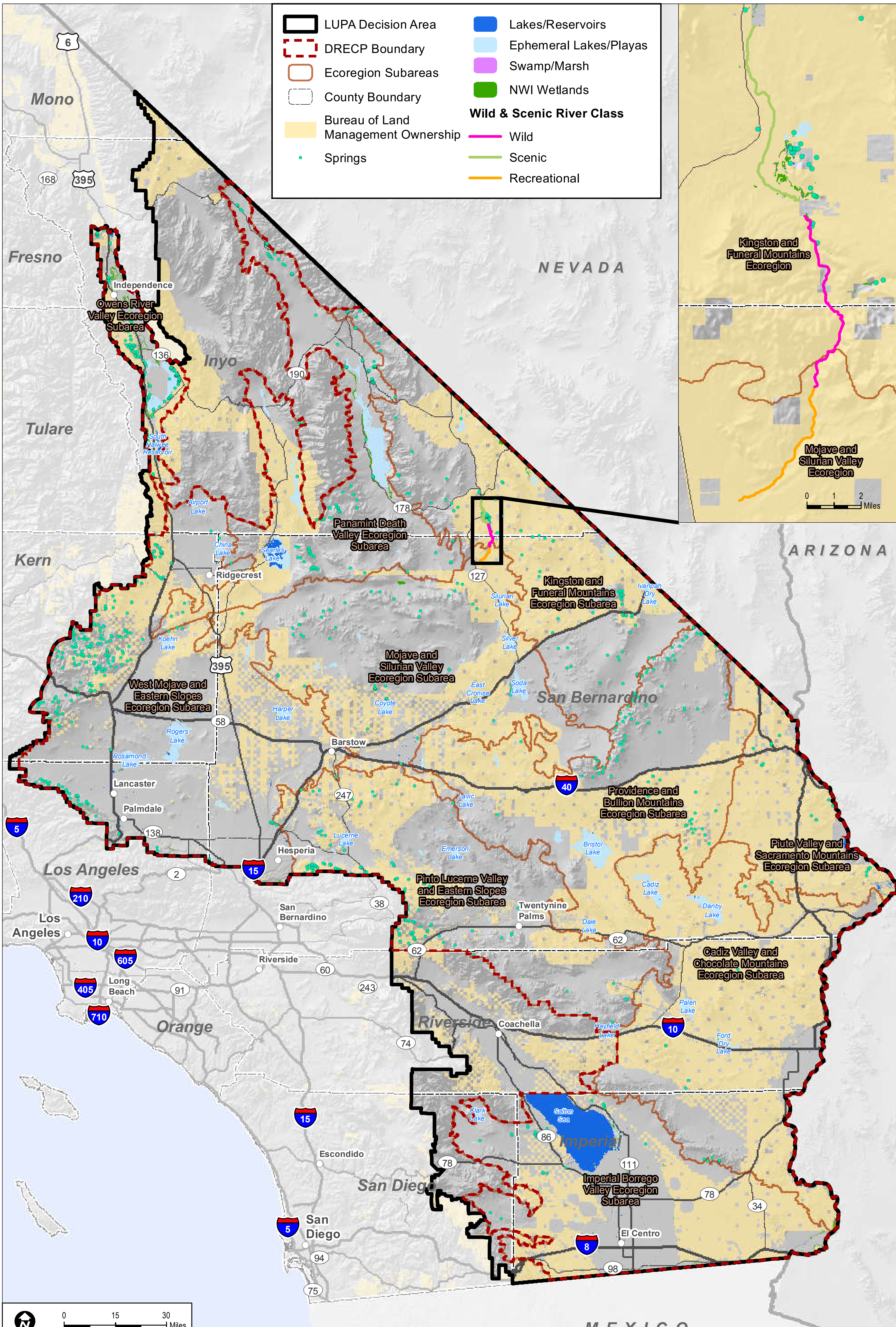

Sources: ESRI (2014); CEC (2013); BLM (2015); CDFW (2013); USFWS (2013); USGS (2011); National Wild and Scenic Rivers System (2011); RECON (2015)

FIGURE III.5-3

Springs and Wild and Scenic Rivers in the DRECP Plan Area

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III.5.2.1 FEMA Flood Hazards

Floodplain maps are generally prepared by the Federal Emergency Management Agency (FEMA) in populated regions with the statistical 0.2% or 1% chance of annual flooding (known as 500-year or 100-year flood events). Because it is sparsely populated, much of the LUPA Decision Area has not been evaluated for potential flood hazards, as shown in Figure III.5-2 (FEMA 2010). Furthermore, highly variable and largely undocumented drainage patterns, such as those characteristic of alluvial fans, make analyzing flood hazards in the LUPA Decision Area a significant challenge (Alluvial Fan Task Force 2010). FEMA-designated flood hazards are further discussed by ecoregion subarea in Section III.5.6.

With respect to BLM LUPA lands, most areas have not been assessed by FEMA for flood hazard, with the exception of the following areas, which have been classified as minimal flood hazard areas:

1. West of Highway 395 in eastern Kern County
2. Western and southern portions of the Owens Valley in Inyo County
3. The Ballarat watershed located in Inyo County (east of Owens Valley)
4. Portions of the Amargosa, Pahrump, and Mesquite watersheds in the northeastern portion of the BLM LUPA Decision Area in Inyo County
5. Most of the BLM LUPA Decision Area in Imperial County

III.5.2.2 Water Quality in the LUPA Decision Area

Water quality conditions in the LUPA Decision Area vary based on both physical characteristics and land use in areas surrounding water bodies. The CWA, as implemented by the SWRCB, protects water quality primarily through the National Pollutant Discharge Elimination System (NPDES) program and the Porter Cologne Act, which relies upon issuance of WDRs. Several water-quality requirements can apply to project construction near water bodies, including:

1. Enrollment under Construction General Stormwater permits.
2. Compliance with municipal stormwater permit requirements.
3. Enrollment under General Dewatering permits,
4. CWA Section 404 permits from the U.S. Army Corps of Engineers for discharges of dredge or fill material into waters of the United States (and accompanying CWA Section 401 Water Quality Certification, issued by Water Boards for federal licenses or permits).
5. Submission of reports of waste discharge and obtaining WDRs.

6. Securing Lake and Streambed Alteration agreements.

A Storm Water Pollution Prevention Plan could be required to address both the construction and operation phases of a project. CWA only pertains to projects that either impact or discharge to waters of the United States. When there is discharge to state waters that are not also waters of the United States (generally meaning waters that do not convey interstate or do not contribute to interstate commerce), the regional board has the discretion to issue waste discharge requirements pursuant to the Porter Cologne Water Quality Act. Water quality is discussed in more detail in Section III.5.5.

III.5.3 Wild and Scenic Rivers Within the LUPA Decision Area

The Amargosa River, within the LUPA Decision Area, was designated as wild and scenic on March 30, 2009 (Figure III.5-3). It includes reaches defined as wild (7.9 miles), scenic (12.1 miles) and recreational (6.3 miles), for a total of 26.3 miles. These reaches are managed by BLM. The BLM is currently preparing a stream management plan for designated sections of the Amargosa River. They are:

- From the northern boundary of Section 7, Township 21 North, Range 7 East to 100 feet upstream of the Tecopa Hot Springs Road crossing.
- From 100 feet downstream of the Tecopa Hot Springs Road crossing to 100 feet upstream of the Old Spanish Trail Highway crossing near Tecopa.
- From the northern boundary of Section 16, Township 20 North, Range 7 East to 100 feet upstream of the Dumont Dunes Access Road crossing in Section 32, Township 19 North, Range 7 East.
- From 100 feet downstream of the Dumont Dunes Access Road for the next 1.4 miles.

For more information, see Chapter III.14, BLM Special Designations, Classifications, Allocations, and Lands with Wilderness Characteristics.

III.5.4 Hydrologic Regions, Basins and Sub-Basins Within the LUPA Decision Area

The LUPA Decision Area falls within two hydrologic regions of the state: South Lahontan and the Colorado River. The two regions are divided into hydrologic units, which are also referred to as watersheds. The watersheds are further divided into hydrologic areas, which in some cases directly correspond to the groundwater basins; otherwise, the groundwater basins fall within the watersheds of their own boundaries. For a description of the physical features of the watersheds, please see Chapter III, Section III.6, Groundwater, Water Supply, and Water Quality.

III.5.4.1 Characterization of Perennial, Intermittent, and Ephemeral Streams

Most surface water streams within the LUPA Decision Area are ephemeral, meaning their flow is occasional in the normally dry washes of this arid region. Flow comes from significant precipitation events, typically thunderstorms, which exceed the infiltration rate capacities of the watershed soils and produce runoff. Perennial rivers and streams typically have water-storage components, such as on the Colorado River, and normally produce continuous flows to meet downstream demands for water supply and environmental protection. Intermittent rivers and streams flow in response to more frequent periods of rainfall or snow melt events and typically flow seasonally in winter and spring.

Ephemeral and intermittent rivers and streams can also be episodic (streams with only periodic flow). Important hydrologic and geomorphic attributes of episodic rivers and streams include:

- Highly localized and extremely variable ephemeral and intermittent flow.
- Flood magnitudes much larger (as a multiple of average flow) than conventional humid-climate streams.
- Strong interactions with shallow groundwater, notably rapid infiltration resulting in decreased downstream flow.
- High-volume episodic movement of sediment.
- Unsuitability for application of most hydraulic modeling.
- Transient forms that confound determinations of active versus earlier stream processes and conventional notions of stable and unstable channel form.

Episodic streams provide numerous ecosystem services including (1) watershed and landscape hydrologic connections; (2) water supply protection and water-quality filtering; (3) wildlife habitat and movement and migration corridors; (4) sediment transport, storage and deposition; (5) groundwater recharge and discharge; (6) vegetation community support; and (7) nutrient cycling and movement. Additionally, these streams interact with adjacent drier upland areas to support critical life stages and contribute to overall regional biodiversity. These systems provide primary habitat, predator protection, movement corridors, migration stop-over sites, breeding and nesting sites, shade, food sources, and water for many species in temporary or permanent pools (SCCWRP 2011).

The process of environmental permitting of renewable energy generation facilities requires an assessment of natural drainage conditions including which channels and other related fluvial (stream-related) landforms are active. However, because the influx of water in episodic streams is unreliable in its timing and quantity, and riparian vegetation is not always present, it can be difficult to recognize an active stream. Lacking a consistently adequate and standardized process for identifying episodic streams, there has been a tendency with recent renewable energy projects to underestimate the extent of streams and the operative fluvial processes on project sites. This has caused long and expensive delays in the permitting process, improper siting of infrastructure that can be damaged by flooding or debris flow, and threats or damage to habitat from lack of avoidance or lower-than–appropriate mitigation for project impacts.

In 2014, protocols were developed for more comprehensive recognition of episodic streams under the Mapping Episodic Stream Activity process and consist of three main steps (Brady and Vyverburg 2014):

1. Using high-resolution aerial imagery to recognize the stream forms and processes – gather information on the physical characteristics
2. Documenting on-the-ground indicators of fluvial activity and inactivity
3. Mapping the watercourse

Table III.5-1 compares flood characteristics for various stream types. Banked rivers are basically the land, including its vegetation, that confines or otherwise defines the outermost boundary of a stream or river when its waters rise to their highest level of confinement. Ephemeral streams are typically within an alluvial fan, respond to thunderstorms of short duration, have flows of short duration (hours), and reach peak stage and flow within hours. Ephemeral stream channels within alluvial fans are more likely than perennial streams to move laterally over time. Perennial and intermittent streams are typically more defined by bed and bank river channels, respond to longer-duration winter storms with longer-duration flows (weeks), and reach their peak stage and flow within hours or days, depending upon the storm. Perennial and intermittent streams normally do not exceed their defined river channels; flooding is primarily contained within their channels.

Table III.5-1
Comparison of Flood Characteristics for Alluvial Fans and Banked Rivers

Characteristic	Alluvial Fans (Ephemeral Streams)	Banked Rivers/Headwaters (Perennial and Intermittent Streams)
Time to Peak	Hours	Hours or Days
Duration of Flood	Hours	Weeks
Area Flooded	Small	Small
Drainage Area	Small	Medium or Large
Characteristic Source	Thunderstorm	Winter & Snow Melt

Table III.5-1
Comparison of Flood Characteristics for Alluvial Fans and Banked Rivers

Characteristic	Alluvial Fans (Ephemeral Streams)	Banked Rivers/Headwaters (Perennial and Intermittent Streams)
High Sediment Load	Yes	No
Human-made Levees	Rare	Rare

Source: FloodSAFE 2010

III.5.4.2 Streamflows for Perennial, Intermittent, and Ephemeral Streams

Table R1.5-1 in Appendix R1.5 describes the range of stream flows within ephemeral, intermittent, and perennial streams and rivers in the LUPA Decision Area: in general, the larger the watershed area the higher the stream flows. Other factors do, however, influence the flow rate produced as runoff from storms and snowmelt. These include the elevation of the watershed, local climate conditions, soil properties, ground slope, and vegetation. Another variable affecting stream flows (summarized in Table R1.5-1 and presented in Appendix R1) is the data collection period; more representative data is collected over longer periods, which tend to capture a greater range and potentially higher maximum historic discharge. Most of the records for ephemeral streams are for limited historical periods, typically 3 to 10 years, and do not warrant the expense of continuous-recording gaging stations. With respect to published data from USGS for stream-flow gages within the LUPA Decision Area, Table R1.5-1 (in Appendix R1) shows historic instantaneous peaks, their dates, and maximum and minimum mean daily discharges, expressed in cubic feet per second (cfs). See Figure III.5-4 for the location of stream gages within the LUPA Decision Area.

III.5.4.2.1 Ephemeral Streams

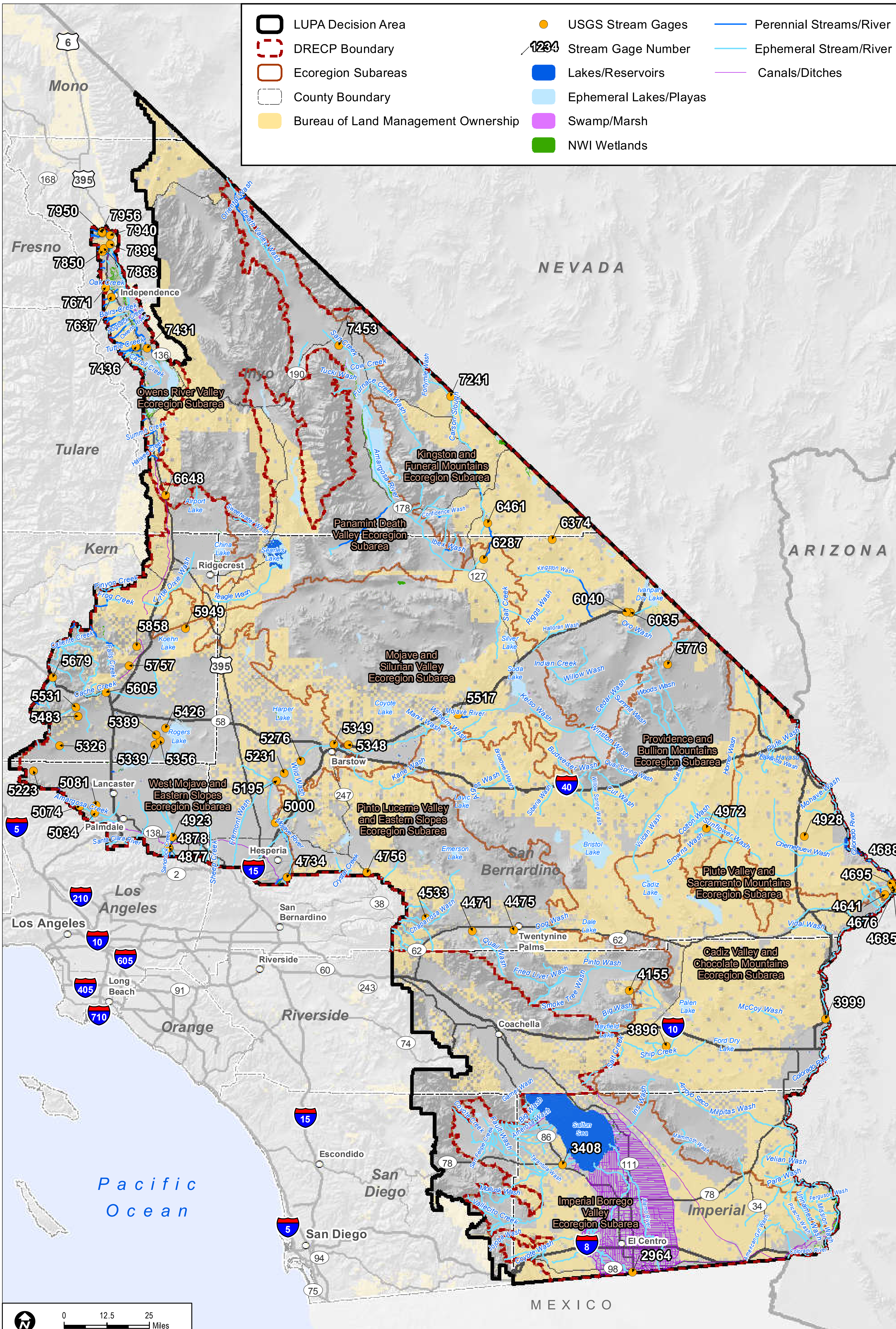
An example of a typical ephemeral stream is the Fortynine Palms Creek near Twentynine Palms (See Table 3.5-2). The instantaneous peak discharge of 1,240 cfs recorded at this site on August 7, 1963, corresponds to a daily mean discharge of 60 cfs. The magnitude of increase from the daily mean discharge to the instantaneous peak discharge illustrates how quickly an ephemeral stream can rise to an extreme flash flood condition, then fall to a much more moderate condition within 24 hours. A further illustration of extreme variability in stream flow happened on August 7, 1963, when the stream discharge would have had to have been significantly less than 60 cfs for part of the same day in order for the daily mean flow to also be 60 cfs. Therefore, the extreme rise to 1,240 cfs and subsequent fall to a moderate flow within only a few hours suggests very intense rainfall, such as from a thunderstorm. As an indication of the variability in the rate and duration in precipitation and thus runoff events within the same drainage area for Fortynine Palms Creek, the historic instantaneous peak discharge on August 7, 1963, does not correspond with the historic maximum daily mean discharge of 69 cfs, which occurred on October 18, 1963 (USGS 2012). This suggests that the intensity or rate of rainfall was less on October 18, 1963, but that the rain lasted for a longer period of time compared with the August 7 event.

III.5.4.2.2 Intermittent Rivers and Streams

Intermittent seasonal stream flows, typically during winter and spring, include the upper Mojave River, the lower portion of the Amargosa Wild and Scenic River, and several mountain-outflow channels along the western edge of the LUPA Decision Area. The Mojave River near Hodge, California, for example, is an intermittent river with a relatively large drainage area of 1,091 square miles compared with the typically significantly smaller drainage areas of ephemeral streams within the DRECP area. Streamflow in the Mojave River near Hodge has a historic instantaneous peak discharge of 12,700 cfs, a historic maximum mean daily discharge of 9,430 cfs, and a historic minimum mean daily discharge of 0 cfs (USGS 2012).

III.5.4.2.3 Perennial Rivers and Streams

The most prominent perennial river within the LUPA Decision Area is the Colorado River; its headwaters begin at about 10,000 feet elevation in the Rocky Mountains of Colorado. The Colorado River flows southwest for 1,470 miles to the Gulf of California (Sea of Cortez) in Mexico. It is the international boundary for 17 miles between Arizona and Mexico. The Colorado River is the nation’s fifth longest river since 1,360 miles of its route are within the U.S. It drains a large portion of the North American continent and covers 242,000 square miles in the U.S. and 3,000 square miles in Mexico. The Colorado River and its tributaries drain southwestern Wyoming and western Colorado, parts of Utah, Nevada, New Mexico, and California, and almost all of Arizona. Based on daily mean discharge in the Colorado River below Imperial Dam, from 1960 to 2011 (see Table 3.5-2), there has always been flow from the Colorado. Other than in a few extreme events, the discharge ranges from about 220 to 3,000 cfs, and is regulated by upstream storage reservoirs (USGS 2012).



Sources: ESRI (2014); CEC (2013); BLM (2015); CDFW (2013); USFWS (2013); USGS (2011); RECON (2015)

FIGURE III.5-4

Stream Gages in the DRECP Plan Area

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The lower Colorado River separates two deserts: the Mojave, Colorado and Sonoran deserts on the California (western) side and the Sonoran on the Arizona (eastern) side. South of the Mojave Desert the Salton Basin, a large structural depression 235 feet below sea level, extends 150 miles northwest from the head of the Gulf of California. The southern desert includes the Colorado to the west side of the LUPA Decision Area and the Sonoran to the east; they are separated by the Chocolate Mountains.

There are two locations on the Mojave River where groundwater is forced to the surface by geologic conditions: the "Narrows" in Victorville, and Afton Canyon east of Barstow. Surface flows are perennial and support extensive wetland and riparian habitats.

III.5.4.2.4 Salton Sea

The Salton Sea is the largest lake in California. Although it has been formed many times in geologic history as part of the Colorado River Delta, the Salton Sea was most recently formed in 1905 when floodwaters caused a levee break on the Colorado River near Yuma, Arizona, and its waters drained into the Salton Basin. The Salton Sea fluctuates in size and capacity, but is currently about 35 miles long, 15 miles wide, occupies 376 square miles, and contains about 7.5 million acre-feet of water. Since the 1905 break threatened agriculture in the Imperial Valley and a major railroad route, the levee was repaired in 1907. Because of its location in the Colorado Desert ecosystem, which has average annual precipitation of fewer than 3 inches per year, the Salton Sea receives minimal inflow from rain. Nearly the entire (90%) inflow to the Salton Sea is agricultural runoff from the Imperial, Coachella, and Mexicali valleys. This inflow carries nutrients, including phosphates and nitrates, which support limited aquatic life. The inflow also carries abundant salt. The Salton Sea salinity level is currently 44 parts per thousand, compared with 35 parts per thousand for the Pacific Ocean.

The Salton Sea's unique feature as a shallow, closed basin makes it vulnerable to both increases or reductions in inflows, which can in turn dramatically change its elevation. Rising lake levels could cause flooding in tribal reservations, wildlife refuge lands, seaside dwellings, marinas, and boat facilities. Salton Sea water levels could be impacted by the:

- Transfer of water from the Imperial Valley to San Diego.
- Reduction of California's Colorado River use from the October 2003 Quantification Settlement Agreement (QSA).
- Possible reclamation of New River water by Mexico.
- Increased evaporation from the Salton Sea's proposed restoration (related to desalinization from solar evaporation ponds).

The proposed transfer of 300,000 acre-feet (related to the QSA water transfers and other reductions) have reduced water supplies for irrigation in the Imperial valley and could in the future reduce irrigation drainage that previously contributed to inflow to the Salton Sea. If these inflows are not replaced, Salton Sea water levels could drop an estimated 16 feet or more, exposing almost 70 square miles of sediments. This could cause air quality problems through blowing dust, seaside homes could be stranded far from shore, and concentrations of salts and nutrients could increase. Although the conserved water transfer from the Imperial Irrigation District has the potential to exacerbate the air and water quality problems at the Salton Sea, those problems would exist in the absence of the transfer due to the other factors noted above. State legislation enacted in 2003 established the Legislature's intent that the State of California undertake the restoration of the Salton Sea, and required the Resources Agency to conduct a study to determine a preferred restoration alternative. Federal, state, and local agencies have studied options for restoration, but so far no comprehensive plan has been implemented.

As background, the 2003 QSA enabled California to implement Colorado River water conservation and voluntary agriculture-to-urban water transfer programs, which reduced the state's water demand to its 4.4 million acre-foot apportionment (SDCWA 2013). It also provided a restoration path for the environmentally sensitive Salton Sea. For more information on the QSA, see Chapter III.6, Section III.6.1.1.6, Colorado River Water Accounting.

III.5.5 Protecting the Water Quality and Beneficial Uses of LUPA Decision Area Waters

Water quality standards "consist of a designated use or uses for the Waters of the United States and water quality criteria for such waters based upon such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water and serve the purposes of the CWA" (40 CFR 131.3[i]). Water quality standards must also include an anti-degradation policy to protect high-quality waters (40 CFR 131.6.). California has adopted both federal anti-degradation policies (40 CFR 131.12) in addition to its own policy (State Board Resolution 68-16). Section 13241 of the Water Code states that "each regional board shall establish water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance…" Section 13241 of the Water Code also describes factors to be considered in establishing water quality objectives. Beneficial uses and water quality objectives to protect those beneficial uses are to be established for all waters of the state. Waters of the state are defined under the Porter-Cologne Water Quality Act as any surface water (including wetlands) or groundwater, including saline waters, within the boundaries of the state.

III.5.5.1 Beneficial Uses

Table III.5-2 identifies the beneficial uses of surface water and groundwater, managed by regional boards, that apply within the LUPA Decision Area.

Table III.5-2
RWQCB Basin Plan Beneficial Uses

Beneficial Use Designation	Description
AGR – Agricultural Supply	Beneficial uses of waters used for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing.
AQUA – Aquaculture	Beneficial uses of waters used for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, and harvesting of aquatic plants and animals for human consumption or bait purposes.
BIOL – Preservation of Biological Habitats of Special Significance.	Beneficial uses of waters that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, and Areas of Special Biological Significance, where the preservation and enhancement of natural resources requires special protection.
COLD – Cold Freshwater Habitat	Beneficial uses of waters that support cold water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
COMM – Commercial and Sportfishing	Beneficial uses of waters used for commercial or recreational collection of fish or other organisms including, but not limited to, uses involving organisms intended for human consumption.
FLD – Flood Peak Attenuation/Flood Water Storage	Beneficial uses of riparian wetlands in floodplain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.
FRSH – Freshwater Replenishment	Beneficial uses of waters used for natural or artificial maintenance of surface water quantity or quality (for example, salinity).
GWR – Groundwater Recharge	Beneficial uses of waters used for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
IND – Industrial Service Supply	Beneficial uses of waters used for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, geothermal energy production, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.
MIGR – Migration of Aquatic Organisms	Beneficial uses of waters that support habitats necessary for migration, acclimatization between fresh and salt water, or temporary activities by aquatic organisms, such as anadromous fish.

Table III.5-2
RWQCB Basin Plan Beneficial Uses

Beneficial Use Designation	Description
MUN – Municipal and Domestic Supply	Beneficial uses of waters used for community, military, or individual water supply systems including, but not limited to, drinking water supply.
NAV – Navigation	Beneficial uses of waters used for shipping, travel, or other transportation by private, military, or commercial vessels.
POW – Hydropower Generation	Beneficial uses of waters used for hydroelectric power generation.
PRO – Industrial Process Supply	Beneficial uses of waters used for industrial activities that depend primarily on water quality.
RARE – Rare, Threatened, or Endangered Species	Beneficial uses of waters that support habitat necessary for the survival and successful maintenance of plant or animal species established under state and/or federal law as rare, threatened or endangered.
REC-1, Water Contact Recreation	Beneficial uses of waters used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs.
REC-2, Noncontact Water Recreation	Beneficial uses of waters used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
SAL – Inland Saline Water Habitat	Beneficial uses of waters that support inland saline water ecosystems including, but not limited to, preservation and enhancement of aquatic saline habitats, vegetation, fish, and wildlife, including invertebrates.
SPWN – Spawning, Reproduction, and Development	Beneficial uses of waters that support high quality aquatic habitat necessary for reproduction and early development of fish and wildlife.
WARM – Warm Freshwater Habitat.	Beneficial uses of waters that support warm water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
WILD – Wildlife Habitat	Beneficial uses of waters that support wildlife habitats including, but not limited to, the preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl.

Table III.5-2
RWQCB Basin Plan Beneficial Uses

Beneficial Use Designation	Description
WQE – Water Quality Enhancement	Beneficial uses of waters that support natural enhancement or improvement of water quality in or downstream of a water body including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, streambank stabilization, maintenance of channel integrity, and siltation control.

Source: RWQCB 2005

The Basin Plan gives equal weight to every beneficial use of both surface water and groundwater. Surface water includes playas and ephemeral washes. For example, referring to the preceding table, desert washes provide beneficial functions and values including groundwater recharge, flood peak attenuation, floodwater storage, and wildlife habitat (RWQCB 2005). Beneficial uses for groundwater include municipal and domestic supply, agricultural supply, industrial service supply, freshwater replenishment, aquaculture, and wildlife habitat.

III.5.5.2 Water Quality Objectives and Effluent Limitations

Ambient or receiving (waters receiving a discharge) water quality objectives are distinct from "effluent limitations" or "discharge standards," though both are typically included in state and federal waste-discharge permits (Water Code Section 13050[h]). The Porter–Cologne Water Quality Control Act defines "water quality objectives" as the allowable "limits or levels of water quality constituents or characteristics established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." Water quality objectives are therefore intended to protect the public health and welfare and to maintain or enhance water quality in relation to the existing or potential beneficial uses of the water. The objectives, when compared with historical and future water quality data, also provide the basis for detecting trends toward both the degradation and enhancement of basin waters.

Effluent limitations serve as the primary mechanism in NPDES and WDRs for controlling discharges of pollutants to receiving waters. Effluent limitations consider both the technology available to control pollutants (e.g., technology-based effluent limits) and limits that protect the water quality standards for the receiving water (e.g., water quality-based effluent limits). Effluent-limit guidelines and standards have been established by EPA for more than 50 different industrial categories, including for steam thermal electric power plants. The regional boards prescribe effluent limitations when issuing NPDES permits for both industrial purposes and as part of the waste discharge requirements of publicly owned treatment works. Effluent limitations apply to waste discharges that may affect the state's water quality.

III.5.5.2.1 Methodology for Establishing Water Quality Objectives

Water quality objectives are either numerical or narrative. Narrative and numerical water quality objectives together define the upper concentrations and other limits that a RWQCB considers safe for the public and the environment. The general methodology used to establish water quality objectives first designates beneficial water uses, then quantifies water quality parameters necessary to protect the most vulnerable (sensitive) beneficial uses. To comply with State Water Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," also known as the "Non-Degradation Objective," water quality objectives may be established at levels higher than necessary to protect the most vulnerable beneficial uses. In establishing water quality objectives, factors other than for designated beneficial uses and the Non-Degradation Objective are also considered. These factors include environmental and economic considerations specific to each hydrologic unit, the need to develop and use recycled water, and the level of water quality that could be achieved through coordinated control of all the factors affecting water quality in an area (Water Code Section 13241). Controllable water quality factors are actions, conditions, or circumstances from human activities that may influence the quality of the waters of the state, and that may be reasonably controlled.

The Basin Plan specifies beneficial uses and water quality objectives for all surface waters for each hydrologic unit and sub-unit drainage feature. The designated beneficial uses and water quality objectives for groundwater within the DRECP ecoregion subareas are discussed in Section III.6.

III.5.6 Flood Hazard, Hydrology, and Drainage Areas Within DRECP Area by Ecoregion Subarea

The existing conditions of surface water resources and flood potential within each ecoregion subarea are characterized or quantified by:

- Surface water linear features and their drainage patterns – as indicated by length (in miles) for ephemeral streams and rivers, perennial and intermittent streams and rivers, and canals and ditches.
- Surface water areal features – as indicated by area (in acres) of nonlinear water bodies including ephemeral lakes and playas, perennial lakes and reservoirs, NWI wetlands (National Wetlands Inventory as compiled by USFWS), and swamps and marshes.

- Springs – as indicated by the number of springs currently identified within the ecoregion subareas.
- Flood hazard – as indicated by floodplain maps prepared by FEMA in populated regions where floods have a 1% statistical chance of occurring each year (known as 100-year flood events). Because it is sparsely populated, much of the LUPA Decision Area has not been evaluated by FEMA for potential flood hazards, so results are inconclusive.

See Chapter III.4, Geology and Soils, for soil data and potential susceptibility to wind and water erosion.

III.5.6.1 Cadiz Valley and Chocolate Mountains Ecoregion Subarea

Surface water resources in the Cadiz Valley and Chocolate Mountains ecoregion subarea of the DRECP area include 12,079 miles of linear surface water features, 71,034 acres of surface water bodies, and 12 springs. The flood hazard potential has not been assessed in the northern and central portions of the ecoregion subarea within San Bernardino and Riverside counties, and is generally minimal in the southern portion, in Imperial County.

III.5.6.2 Imperial Borrego Valley Ecoregion Subarea

Surface water resources in the Imperial Borrego Valley ecoregion subarea include 7,307 miles of linear surface water features, 420,565 acres of surface water bodies, and 34 springs. The potential for flood hazard is either minimal or has not been assessed in both the western and eastern portions of the ecoregion subarea. The central portion draining into the Salton Sea is predominantly within the 100-year floodplain (having a 1% annual chance of a flood of a determined significant magnitude).

III.5.6.3 Kingston and Funeral Mountains Ecoregion Subarea

The unique feature within the Kingston and Funeral Mountains ecoregion subarea is the Amargosa River, a portion of which is designated wild and scenic, shown in Figure III.5-3. Surface water resources include 9,742 miles of linear surface water features, 36,854 acres of surface water bodies, and 119 springs. The potential for flood hazard is minimal in the northern portion of the ecoregion subarea within Inyo County, and has not been assessed for the southern portion in San Bernardino County.

III.5.6.4 Mojave and Silurian Valley Ecoregion Subarea

The Mojave and Silurian Valley ecoregion subarea includes the southern portion of the Amargosa River, designated as wild and scenic, shown in Figure III.5-3. The surface water resources include 8,542 miles of linear surface water features, 91,711 acres of surface water bodies, and 63 springs. The potential for flood hazard has not been assessed, with the exception of several areas along the Mojave River within the 100-year floodplain.

III.5.6.5 Owens River Valley Ecoregion Subarea

Surface water resources in the Owens River Valley ecoregion subarea include 1,493 miles of linear surface water features, 121,205 acres of surface water bodies, and 130 springs. The potential for flood hazard is primarily minimal with the exception of several areas within the 100-year floodplain.

III.5.6.6 Panamint Death Valley Ecoregion Subarea

Surface water resources in the eastern portion of the Panamint Death Valley ecoregion subarea include 10,089 miles of linear surface water features, 275,309 acres of surface water bodies, and 172 springs. The potential for flood hazard is primarily minimal in the northern portion of the ecoregion subarea within Inyo County, and has not been assessed for the southern portion in San Bernardino County. A few small areas around Kelso Wash are within the 100-year floodplain.

III.5.6.7 Pinto Lucerne Valley and Eastern Slopes Ecoregion Subarea

Surface water resources in the Pinto Lucerne Valley and Eastern Slopes ecoregion subarea include 6,291 miles of linear surface water features, 27,832 acres of surface water bodies, and 144 springs. The potential for flood hazard has not been assessed for most of the ecoregion subarea, with the exception of a few areas along State Route 62 near Twentynine Palms, which either have minimal risk or are within the 100-year floodplain.

III.5.6.8 Piute Valley and Sacramento Mountains Ecoregion Subarea

Surface water resources in the Piute Valley and Sacramento Mountains ecoregion subarea include 4,818 miles of linear surface water features, 7,045 acres of surface water bodies, and 26 springs. The potential for flood hazard has not been assessed.

III.5.6.9 Providence and Bullion Mountains Ecoregion Subarea

Surface water resources in the Providence and Bullion Mountains ecoregion subarea include 7,933 miles of linear surface water features, 55,415 acres of surface water bodies, and 80 springs. The potential for flood hazard has not been assessed.

III.5.6.10 West Mojave and Eastern Slopes Ecoregion Subarea

Surface water resources in the West Mojave and Eastern Slopes ecoregion subarea include 11,270 miles of linear surface water features, 138,067 acres of surface water bodies, and

294 springs. The potential for flood hazard is primarily minimal west of U.S. Route 395 (U.S. 395), with the exception of some areas in the vicinities of Lancaster and Palmdale, which are within the 100-year floodplain. The potential for flood hazard east of U.S. 395 has not been assessed.

III.5.7 Flood Hazard, Hydrology, and Drainage Outside of the LUPA Decision Area

The regulatory setting related to groundwater, water supply, and water quality outside of the LUPA Decision Area includes the laws, ordinances, and regulations described in Section III.1.1, Regulatory Setting.

Table III.5-3 (Stream Crossings Outside of LUPA Decision Area) lists the streams crossed by the transmission corridors outside the LUPA Decision Area. Hundreds of unnamed washes also cross the corridors. In arid areas stream channels are generally ephemeral in the foothills and become less defined washes along the desert floor. The flat topography and lack of defined channels on the desert floor can lead to unconfined overland flow during storms. Streams in the mountainous regions of southern California are generally dry in the summer months (though perennial flows may occur), especially in larger streams. Many of the drainages in urban regions have been lined with concrete to support flood control, or have been otherwise altered to conform to the developed landscape. Crossings that would create a discharge of dredged or fill material would likely require either a CWA Section 404 Permit and Section 401 Water Quality Certification if it was a water of the United States, or Waste Discharge Requirements if a water of the state. If the project spanned several regional boards, the State Board would issue either a WDR permit or 401 certification.

RWQCB Basin Plan beneficial uses could apply to watercourses in transmission corridors outside the LUPA Decision Area, depending on location. The beneficial uses presented in Table III.5 3 (RWQCB Basin Plan Beneficial Uses) also apply to the surface water resources in the transmission corridors outside the LUPA Decision Area. Table III.5-3 (Stream Crossings Outside of LUPA Decision Area) identifies waterways outside their respective areas by transmission corridors.

Table III.5-3
Stream Crossings Outside of LUPA Decision Area

San Diego Area		
Alpine Creek	Hauser Creek	San Diego River
Beeler Creek	La Posta Creek	San Vicente Creek
Boulder Creek	Lawson Creek	Sweetwater River
Boundary Creek	Little Potrero Creek	Taylor Creek

Table III.5-3
Stream Crossings Outside of LUPA Decision Area

San Diego Area		
Carrizo Creek	Los Coches Creek	Tule Creek
Chocolate Creek	Miller Creek	Viejas Creek
Cottonwood Creek	Myer Creek	Walker Creek
Coyote Wash	Poway Creek	Wilson Creek
Grapevine Creek		
Los Angeles Area		
Alder Creek	Josephine Creek	Rubio Wash
Alhambra Wash	Little Dalton Wash	Rush Creek
Arroyo Seco	Little Rock Wash	San Dimas Wash
Big Dalton Wash	Live Oak Wash	San Gabriel River
Big Tujunga Creek	Lucas Creek	Santa Anita Wash
Charter Oak Creek	Manzanita Wash	Santa Clara River
Clear Creek	Marshall Creek	South Fork Lytle Creek
Compton Creek	Middle Fork Lytle Creek	Thompson Wash
Cucamonga Creek	Middle Fork Mill Creek	Trail Fork
Day Canyon Wash	Mill Creek	West Fork Alder Creek
Day Creek	Mission Creek	West Fork San Gabriel River
Deer Canyon Wash	Monte Cristo Creek	South Fork Santa Clara River
Deer Creek	Mule Fork	*Real Wash*
East Br Big Dalton Wash	North Fork Lytle Creek	*Piru Creek*
East Etiwanda Creek	North Fork Mill Creek	*Mule Fork*
Eaton Wash	Oro Grande Wash	*Gold Creek*
Fall Creek	Rio Hondo	*Little Tujunga Creek*
Fox Creek		
North Palm Springs–Riverside Area		
Box Canyon Wash	Pinkham Wash	Yucaipa Creek
Garnet Wash	Potrero Creek	Warm Creek
Hathaway Creek	Red Butte Wash	*Sheep Creek*
Jenson Creek	San Gorgonio River	*Santiago Creek*
North Palm Springs–Riverside Area		
Little San Gorgonio Creek	San Jacinto River	*Santa Ana River*
Lytle Creek	San Timoteo Wash	*Little Morongo Creek*
Montgomery Creek	Smith Creek	*Handy Creek*
Morongo Wash	Super Creek	*Dry Morongo Creek*
Noble Creek	Twin Pines Creek	*Chino Creek*
One Horse Creek	Whitewater River	*Big Morongo Creek*

Table III.5-3
Stream Crossings Outside of LUPA Decision Area

Central Valley Area		
Arkansas Creek	Comanche Creek	Los Gatos Creek
Arroyo Bifido	Corral Hollow Creek	Martin Creek
Arroyo Ciervo	Cottonwood Creek	Martinez Creek
Arroyo Degollado	Crow Creek	Mustang Creek
Arroyo Doblegado	Del Puerto Creek	Orestimba Creek
Arroyo Estrecho	Domengine Creek	Ortigalita Creek
Arroyo Finito	Garzas Creek	Panoche Creek
Arroyo Hondo	Goose Lake Slough	Patterson Run
Arroyo Largo	Hospital Creek	Piedra Azul Creek
Arroyo Murado	Ingram Creek	Quinto Creek
Arroyo Pino	Kern River Channel	Salado Creek
Arroyo Robador	Laguna Seca Creek	Salt Creek
Arroyo Torcido	Little Panoche Creek	Tejon Creek
Arroyo Vadoso	Little Salado Creek	Zapato Chino Creek
Cantua Creek	Lone Tree Creek	*Tumco Wash*
Chanac Creek	Los Banos Creek	*Indian Wash*

Waterways indicated in *italic* are crossed by alternatives to the Preferred Project.

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